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CAUVERY RESERVOIR PROJECT.

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LEADING TO

THE MYSORE-MADRAS ARBITRATION.

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SELECT PAPERS FROM THE CORRESPONDENCE

LEADING TO THE

MYSORE-MADRAS ARBITRATION.

No. 60.—*D. O. letter dated 21st March 1913, from the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

As promised yesterday, I enclose a copy of the statement received from Sir Harold Stuart, which he described as representing the Madras Government's minimum requirements for existing irrigation. He added that his Government are not prepared to reduce their claims in this respect, while it is believed that the Mysore Durbar still consider them excessive.

I am telling Sir Harold that you have a further statement of the case under preparation, which you hope to let me have by the end of this month, and that I propose to await this before taking any further steps in the matter.

No. 60 A.—*Copy of statement appended to Sir Harold Stuart's D. O. letter of the 27th February 1913.*

I. That the following discharge shall be passed down the Cauvery for use in Madras before any impounding takes place in the Mysore reservoir:—

	Cusecs.
(1) During the months of August, September, October and first half November	29,340
(2) During the months of June, July, second half of November, all December, January and February	26,680
(3) During March, April and May	Nil.

II. That the measurement of the water passed down should be made at Sivasamudram or at some other convenient place as near as possible to the proposed Mysore reservoir.

No. 61. PERSONAL.—*Letter dated Ootacamund, 5th April 1913, from the Hon'ble Col. Sir Hugh Daly, K.C.I.E., C.S.I., to the Dewan of Mysore.*

I have been reading up the Cauvery file and considering your last official letter dated the 31st March.

It seems to me that the only chance of inducing the Madras Government to agree to the completion of the Mysore reservoir is to make an effort to meet them as regards their own scheme and to state distinctly what the Durbar are prepared to do and to accept.

I have drawn up the enclosed draft of a memo for communication to Madras. I have done so with much diffidence, for the subject is technical. If I have made any grave errors, you must kindly excuse me. I fully expect that the memo will in any case need much revision, even if it can be accepted as a mere basis for a draft.

I am working on the assumption that you are fully convinced that there is ample water for *both* the new projects (for that in Madras as well as for that in Mysore), without prejudicing the existing irrigation in Madras. If you are so convinced, it seems to me that, with His Highness' approval, the Durbar might proceed on that conviction.

Regarding measurement at Sivasamudram, I am not quite clear. But so far as I can see, there is no important reason why the Durbar should not agree to measurement there, provided that the amount to be given is not excessive.

Your letter of the 31st March and the Chief Engineer's note of the 23rd February appear to me to prove conclusively that Madras cannot make good their claim for the amount they have demanded. The question then is what amount should be offered to them.

So far as I am able to judge, it would be liberal to offer them, at Sivasamudram, the maximum to which they are at present entitled at the Cauvery Dam. Whether this is more than can safely be offered, I am not sure; but I do not find anything to suggest that the offer would involve special risk to the Durbar.

Speaking purely as a tyro in such matters, it seems to me that, if the amount to be given at Sivasamudram were referred to arbitration, Madras could not possibly get more than the Cauvery Dam maximum and might well get less. I should hope, therefore, that they would accept the suggested offer. But of course there may be reasons against making the offer, which I do not appreciate.

If the whole case goes to arbitration, as suggested by the Government of India, I think it is clear that all facts and arguments must be brought forward during the Arbitrator's enquiry, and that, after the enquiry is closed, no new facts or arguments can be advanced. The utmost which can be suggested, I think, is that, before final orders are passed, each party should be advised of the Arbitrator's proposals and be given an opportunity of indicating errors and omissions (if any) connected with facts and what the facts suggest.

At the present stage at any rate, I shall not send this letter and my draft memo into my office. I shall be obliged therefore if you will for the present treat them as personal, though of course showing them, if you wish, to His Highness or to any one with whom you may have to discuss the matter.

Sir H. Stuart, as you know, is very anxious to get forward with the case and I have promised him to do my best to expedite it.

No. 61 A.—*Cauvery Projects, etc.*

In his note of 12th May 1911, Sir J. Benton wrote:—

"The effect of operating the proposed Mysore reservoir on the following conditions was investigated.

"(i) The Madras irrigation works to continue to have the supply they now "draw off, that is, up to 7 feet gauge readings on the Cauvery Dam with 10 per "cent extra in certain months as proposed by the Madras Government."

"(ii) The Mysore reservoir to impound water in excess of (i) above."

"The result was found to be that the power scheme would fail in 3 years out "of 20."

"The rule to run in the Cauvery all the water up to 7 feet on the gauge at "the dam is the general present practice and reduction would mean serious loss of "irrigation. A discharge of 26,680 cusecs amounts to about 2,300 million cubic "feet per day."

"Conclusions.

"(i) That the existing Madras irrigation requires the supplies of water as "actually diverted over the Cauvery Dam for irrigation in the past;.....that no "curtailment of these supplies is possible without inflicting very serious loss on "the cultivators of the delta..... and that no reduction is compatible with the "Agreement of 1892."

2. Since it is admitted in the above, as elsewhere, that the practice has been to draw off up to 7 feet gauge readings on the Cauvery Dam (when so much was available), it seems to be established that, under the Agreement of 1892, Madras have no claim to an extra 10 per cent.

3. This matter of the gauge reading was discussed in the Dewan's letter No. 27, dated the 7th July 1911, when he concluded by observing:—"If, from the "data now available, the Madras Government feel unable to reduce the 7 ft. limit, "the Durbar are willing to accept that limit in the monsoon months, *provisionally* "*for a period of six years*, subject to reduction by mutual consent after further "observation and study of the river discharges."

4. In para 3 of his letter No. 386-I, dated the 10th January 1911, Mr. Clerk had written :—

"The reading of 7 ft. on the Cauvery Dam gauge has for many years past been "recognized as indicating the amount necessary to give full supply to the delta. "This high gauge is necessary on account of the intermittent nature of the supply "and although it is not always possible to maintain that level, this Government "are of opinion that it cannot be deliberately reduced without affecting the exist-"ing interests in the Tanjore Delta. Were a constant supply guaranteed, it might "be possible to reduce this level."

This passage not only supports the view that the claim for an extra ten per cent is inadmissible, but indicates that, in certain circumstances, the arrangement might be modified as suggested by the Dewan.

5. In his supplementary note of the 28th July 1911, Sir J. Benton said :—

"I would advise that the period for trial may be 20 instead of 6 years." His reasons which follow being the undesirability of reducing Mysore irrigation in a bad year.

The Durbar are quite willing to accept this extended period for trial, it being of course understood that the arrangement might at any time be modified, within the period, by mutual consent.

6. In his note of the 12th May 1911, Sir J. Benton wrote :—

"The Cauvery supplies abundant water.....provided that sufficient storage capacity is provided to carry forward the flood supplies to meet the requirements of dry periods in advance; the entries in Appendix VI, column 3, clearly show this."

It is the conviction of the Durbar that the waters of the Cauvery are ample to supply (i) all existing irrigation in Madras (ii) the proposed storage in Mysore, and also (iii) the projected storage in Madras. The Durbar appeal to the following passages in the Dewan's letters as indicating that they are prepared to act on, and to accept any risks arising from, this conviction :—

(*a*) *Letter No. 4, dated the 1st July 1911.*—"The Mysore Government are satisfied that the construction of their reservoir will not in the least interfere with the existing irrigation in the Madras Presidency."

(*b*) *Letter No. 27, dated the 7th July 1911.*—"If all the conclusions and opinions go against this scheme, the worst that can happen will be that, in three years out of every 20, there may be a shortage of supply in Mysore. In such an eventuality, the Durbar will take steps to curtail their hot weather irrigation in the affected years."

(*c*) *Letter No. 2553, dated the 7th July 1911.*—"We are confident we are not trenching on the Madras supply. The Government of Madras can have no reason to complain if we take all the risks of short supplies."

(*d*) *Letter No. 239, dated the 10th September 1911.*—"The Madras Government suggested that our reservoir may not fill in three years out of every 20; but it has been shown (*vide* references in the margin) that there scarcely appear to be any grounds for this apprehension. Should it ever fail, the Durbar are prepared to curtail temporarily the area of hot weather irrigation, but the Madras supply will not be interfered with."

Para 10 of Chief Engineer's note dated 8th May 1911.
Para 6 of my No. 27, dated 7th July 1911.

(*e*) *Letter No. 240, dated the 11th September 1911.*—"We are certain that further investigations will show that there will be no interference with the water-supply to the irrigation in Madras and when the question is fully threshed out by the Government of India, we entertain no misgivings as to the results. But we do not of course expect acquiescence from the Government of India at this stage."

7. The Durbar have shown their readiness to fall in with the wishes of the Madras Government by accepting the suggestion for two more low level vents in the dam at Kannambadi. Dewan's letter No. 11, dated the 10th May 1912.

8. In para 4 of this memorandum, Mr. Clerk's remark as to the guarantee of a constant supply is quoted. Para 35 of the note by the Chief Engineer (enclosure in the Dewan's letter No. 838, dated the 31st March 1913), calls attention to the balancing effect of the Mysore reservoir.

Para II of the Chief Engineer's note dated the 8th May 1911, contains suggestions as to gauges, etc., (the Durbar having undertaken to meet all charges for telegrams) and the Dewan in his letter No. 239, dated the 10th September 1911, expressed the entire readiness of the Durbar to amplify these suggestions in accordance with the wishes of the Madras Government.

9. The Madras Government have recently proposed that the discharge for the irrigation of the Tanjore Delta shall be measured at or near Sivasamudram instead of at the Cauvery Dam as hitherto. It is understood that this suggestion is made in connection with the new storage reservoir which the Madras Government propose to construct. The views of the Durbar on this suggestion were given in the Dewan's letter No. 11, dated the 10th May 1912, and are amplified in his letter No. 838, dated the 31st March 1913, and in the enclosure. Special attention may for the present be drawn to three points:—

(i) Sir J. Benton, in his note of the 28th July 1911, observed that, if such a change were made, credit must be given to the Durbar for "the net increase in the river discharge between Mysore and the Upper Anikat."

(ii) Para 33 of the Chief Engineer's note of the 23rd February 1913 shows that the consequent delay in the adjustment of supplies should in fairness be taken as three days instead of four, as suggested by the Madras Government.

(iii) Para 36 of the same note shows that nearly half the supply in the Cauvery at Sivasamudram is not affected by the Mysore reservoir at Kannambadi.

In the above circumstances, it would seem, as indicated in the Dewan's letter No. 838, dated the 31st March 1913, that the Durbar might fairly claim that, if the change is made, the supply at Sivasamudram should be *less* (*not greater*) than that now given at the Cauvery Dam.

10. The Durbar are, however, fully confident of the capacity of the Cauvery to cover both their own storage scheme and that of the Madras Government, without interfering with existing irrigation in Madras and they are most anxious to do nothing which might delay the Madras project.

The Durbar are accordingly prepared to agree to the discharge being measured at or near Sivasamudram on the understanding—

(*a*) that the amount shall not be in excess of the maximum (7 feet) at present given at the Cauvery Dam;

or, if the Madras Government do not agree to this,

(*b*) that the amount to be discharged shall be settled by arbitration as provided in the Agreement of 1892.

In either case, the amount might, in the first instance, be fixed for a term of years, which, in accordance with Sir J. Benton's suggestion as to measurements at the Cauvery Dam, might be 20 years. It would of course be open to the parties to revise the amount, by mutual consent, before the expiry of the 20 years.

11. The foregoing notes show that the Durbar are most anxious to arrive at an amicable understanding with the Madras Government. It seems to the Durbar that the undertakings which they are prepared to give and the arrangements which they are ready to make should satisfy the Madras Government that they can now, without risk of any sort, give their consent to the completion of the Durbar's storage project.

12. Should the Madras Government still be unable to grant the desired consent, the Durbar are quite willing that the matter should be referred to arbitration, as suggested by the Government of India. But, in view of the very important interests involved and of the divergent statements as to facts which have appeared in the correspondence, the Durbar hold very strongly that, before final orders are passed by the Government of India, the proposals of the Arbitrator should be communicated both to the Madras Government and to the Durbar.

It should be distinctly laid down that neither party would be permitted, at that stage, to bring forward any new facts or arguments, since all such should be laid before the Arbitrator during the enquiry. But either party should, in the Durbar's opinion, be at liberty to indicate to the Government of India, before final

orders are passed, the points (if any) in the Arbitrator's proposals which may appear to involve important errors or omissions relating to facts, or incorrect deductions from such facts.

No. 62. PERSONAL.—*Letter dated 11th April 1913, from the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

Many thanks for your personal letter of the 8th, which I received yesterday. You will of course remember that, after our talk on the 5th February, I wrote to Sir Harold Stuart telling him of your suggestion for further informal discussion. I made it perfectly clear that you were fully convinced of the strength of the Durbar's case and that your sole object was to endeavour to secure an amicable settlement, without the trouble and expense of arbitration. Sir H. Stuart, as I told you when we spoke again on the 20th March, replied on the 27th February :— "I have carefully considered the suggestion of the Dewan that there should be "further informal discussion on the subject and have come to the conclusion that "it would be useless. This Government have stated their minimum requirements "for existing irrigation and are not prepared to reduce their claims in this respect, "while it is believed that the Mysore Durbar still considers them excessive. In "these circumstances I considered that the sooner the question is decided by an "impartial tribunal, the better." As to the procedure, he said :—"We must stipu- "late that the whole case on either side shall be fully placed before the Judge and "his Assessor and that no fresh arguments or facts which have not been considered "by him shall be brought forward for the consideration of the Government of "India, otherwise we shall have further correspondence and more of that delay "which we are so anxious to avoid." Sir H. Stuart appended to his letter "a state- ment of the claims of the Madras Government" copy of which I sent to you on the 21st March.

I replied to Sir H. Stuart that you had under preparation a further statement, which might prove helpful ; that, on receiving it, I would, if necessary, consult him again ; but that otherwise I would make the official reference to the Govern- ment of India accepting arbitration with the provision suggested by you. Sir H. Stuart, as I informed you on the 27th March, answered deprecating further delay and mentioning the inconvenience caused to Colonel Ellis.

On the 2nd April, I received direct from you the spare copies of your official letter of the 31st March. I sent one copy to Sir H. Stuart, promising to deal with the matter urgently as soon as I received my file from Bangalore. A copy of the Chief Engineer's Note was sent to him from Bangalore.

It is specially in view of what Sir H. Stuart wrote on the 27th February (as quoted above), that it seems to me useless to suggest further discussion unless the Durbar are willing to make a statement of what they are ready to do and to accept.

I do not think there need be any apprehension that the Madras Government would not appreciate and respond to a frank statement. In the matter of the con- struction of the smaller reservoir, I found them most ready to meet the Durbar directly the safeguards which they considered to be essential were accepted.

There appear to me to be two courses open :—

(1) to put forward some statement of the Durbar's views (such as that which I have drafted, but modified, of course, in any way that you may consider desirable), and then to propose further discussion on that basis, as suggested in your letter of the 8th April; or,

(2) simply to inform Sir H. Stuart that, unless your official letter of the 31st March and the Chief Engineer's Note suggest any other course to him, the Durbar are now willing to agree to arbitration, as suggested by the Government of India, and also agree that, after the enquiry, no fresh facts or arguments should be brought forward, though you consider that, before final orders are passed by the Government of India, both the Durbar and the Madras Government should have an opportunity of indicating points (if any) in which the Arbitrator's proposals may appear to involve important errors or omissions relating to facts or incorrect deduc- tions from such facts.

As you tell me you will be absent from Bangalore for a few days, I am sending a copy of this letter direct to His Highness.

I am especially anxious to avoid giving the Madras Government any ground for representing that the case is being unnecessarily delayed by the Durbar.

No. 63. PERSONAL.—*Letter dated the 15th April 1913, from the Dewan of Mysore, to the Hon'ble the Resident in Mysore.*

I feel favoured by your letter dated the 11th instant, marked "personal," which I received on my return here yesterday. I was also shown in Mysore the copy you had kindly forwarded to His Highness the Maharaja and had an opportunity of discussing the question with His Highness. I have studied the draft note which accompanied your letter of the 5th instant.

The correspondence which has hitherto passed is entirely on the assumption that the Madras Government require the water-supply safeguarded for their present irrigation. On this aspect of the question, I believe we have made the Durbar's position perfectly clear. Our last official letter of the 31st March is already in their hands and unless fresh facts and figures are put forward, no new statement on the part of the Durbar seems necessary. The Madras Government can have no reason to complain of delay on our part.

Under the terms of the Agreement, we are only concerned with the requirements of existing irrigation in the Madras Presidency. There is no obligation on our part to provide a supply for their new reservoir although I stated to you that the question might be discussed personally, if desired, at Ootacamund.

I would invite your kind reference to para 23 (ii) (page 10, of Sir John Benton's note dated 12th May 1911).

In your letter of the 5th April, I notice you say:—

"I am working on the assumption that you are fully convinced there is ample water for both the new projects."

I am not so convinced. The *average* supply will fill both the reservoirs, but not the supply in bad years. I would invite your kind reference to para 10 (3) of the Mysore Chief Engineer's note, dated 8th May 1911. What I perhaps stated to you in personal conversation was the opinion hazarded by a high officer in personal conversation. It was not my opinion.

If the case goes to arbitration, I hope you will kindly stipulate that each party has access to all the arguments placed before the arbitrator by the other party, and that, before the enquiry is closed, each party will be allowed to see the other's statements.

I feel most grateful to you for your "personal" communications and frank discussion, and I yet hope that an early solution of this important question may be possible without going up to the Government of India.

No. 64.—*D. O. letter dated the 17th April 1913, from the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

I am much obliged for your letter of the 15th received yesterday. I am sorry that I misunderstood you as to the sufficiency of water for both projects. There certainly appears to be no obligation on the Durbar to assist Madras as regards the supply for their new reservoir; but it seemed to me that the only chance of settling matters without a reference to the Government of India was to make Madras an offer and I thought this might be done without risk. As I was wrong in this, there seems to be nothing for it but to accept arbitration.

Sir Harold Stuart wrote me on the 15th instant that the Madras Government find nothing in your letter of the 31st March, or in the Chief Engineer's note of the 23rd February, to induce them to withdraw or modify their objections to the Durbar's large project. He hopes therefore that the matter will be brought to arbitration as quickly as possible.

In the circumstances, I now propose to write to the Government of India that, with the proviso given in your letter of the 15th April, the Durbar agree to the case going to arbitration so soon as this can be arranged.

Will you kindly let me know at your early convenience whether the Durbar agree to my writing to the Government of India as proposed?

No. 65.—*Letter No. 2534, dated the 24th April 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

I am directed to request that the Resident may be supplied, at an early date, with a statement of the daily discharges on which are based the half-monthly totals given in statement A that accompanied the note by the Officiating Chief Engineer of Mysore on the "Draft rules for regulating supplies in the Cauvery river required for Madras irrigation." These discharges are required by the Government of Madras for comparison with the daily discharges at Bhavani bridge.

2. The Madras Government will be obliged if the methods by which the discharges were arrived at can also be described for their information.

No. 66.—*Letter No. C. 26, dated 1st May 1913, from the Hon'ble the Resident in Mysore, to the Secretary to the Government of India, Foreign Department.*

In continuation of my telegram of the 4th February last, as marked on the margin, I have the honour to forward a copy of a letter No. 609, dated the 22nd January 1913, conveying the views of the Durbar regarding the proposal to submit to arbitration the questions which are at issue between the Madras Government and the Durbar in respect of the storage, etc., of the Cauvery waters.

"No. 766. Your telegram 28-1. B. January 13th. Durbar consider interests involved in Cauvery case so important that final decision must rest with Government of India and cannot be left to single arbiter. They would, however, welcome enquiry on lines suggested and would gladly bear half cost. Letter follows."

2. I have since had the advantage of discussing the matter fully with the Dewan. The main points raised by the Madras Government are:—

(i) The desirability of changing the point for measuring the water passed down from the Cauvery Dam (where it is measured at present) to Sivasamudram, or some other place as near as possible to the proposed Mysore reservoir;

(ii) the method of measuring the water passed down.

In the opinion of the Durbar, these points are simple and might be settled by the Government of India, after calling for such further information, if any, as might be necessary. After the points had been settled in such a manner as to secure the safeguarding of *existing* irrigation in Madras, the Durbar should, they consider, be free to store the surplus waters.

3. Should the Government of India, however, prefer that the matter form the subject of arbitration, the Durbar are prepared to bear half the cost, the Arbiter and Assessor being nominated by the Government of India, after consultation with both parties as indicated in your telegram of the 13th January. It is assumed that, if this course were adopted, the Madras and Mysore Governments would each be empowered to detail an engineer to furnish full information on the engineering details which would be included in the scope of the enquiry, and it would probably be laid down (i) that the whole case on either side should be fully placed before the Arbiter and Assessor, and that no fresh facts or arguments should be subsequently advanced; (ii) that each party should have access to all the arguments put forward by the other party and should see the other party's statements before the enquiry was closed.

4. Should such an enquiry not result in a conclusion acceptable to the Durbar, they would strongly urge that, having regard to the extreme importance of the matter and to the somewhat conflicting nature of the statements which have from time to time been made as to facts and factors bearing on the case, each party should be permitted to see the proposed award, before final orders are passed by the Government of India, and should be given the opportunity of indicating the points (if any), in which the award may appear to them to involve important errors or omissions relating to facts, or incorrect deductions from such facts.

5. If recourse is had to arbitration, the procedure suggested by the Durbar appears to me to be in accord with that contemplated by the rules which were drawn up in 1892 and which were accepted by the Government of India in their letter in the P. W. D. No. 80-1, dated the 26th April 1892, to the address of the Madras Government. The third of those rules provides that the Durbar must obtain the consent of the Madras Government to the construction of any "New Irrigation Reservoir" and that the Madras Government "shall be bound not to refuse such consent except for the protection of prescriptive right already acquired and actually existing."

The fourth rule runs:—"Should there arise any difference of opinion between the Madras and Mysore Governments in any case in which the consent of the former is applied for under the preceding rule, the same shall be referred to the final decision either of Arbitrators appointed by both Governments, or of the Government of India."

6. I enclose a copy of a further letter No. 838, dated the 31st March 1913, from the Durbar, with a copy of the note therein mentioned, in which the questions raised by the Madras Government are discussed in detail. The Durbar hope that the Government of India will be pleased to obtain and consider the reply of the Madras Government before determining whether they should decide the question themselves or whether reference should be had to arbitration.

7. A copy of my present letter, with accompaniments, is being forwarded for the information of the Government of Madras.

No. 67.—*Letter No. 580—13, dated the 7th May 1913, from the Joint Secretary to Government, P. W. D., Irrigation Branch, to the Hon'ble the Resident in Mysore.*

I am directed to refer to my letter No. 217-I, dated 21st April 1913, and to request that, in addition to the statement asked for therein, you will kindly arrange to obtain and furnish this Government with the following statements for the same period:—

(i) Daily gauge readings at Sivasamudram anikat.
(ii) Daily discharges of the Power Works canal.

2. I am further to request that this Government may be informed if the discharges at Sivasamudram shown in Appendix to note by the Acting Chief Engineer, Mysore, include the quantities of water used for power or not.

No. 67 A.—*Letter No. 2820, dated the 9th May 1913, from the First Assistant to the Hon'ble the Resident, to the Dewan of Mysore.*

A copy of the foregoing letter is forwarded herewith to the Government of His Highness the Maharaja of Mysore, in continuation of this office No. 2534, dated the 24th April 1913, with the request that the statements and information asked for by the Government of Madras may be furnished to this office at an early date.

No. 68.—*Letter No. 2851, dated the 10th May 1913, from the First Assistant to the Hon'ble the Resident, to the Dewan of Mysore.*

I am directed to request that arrangements may kindly be made for the early supply to this office, for transmission to the Government of Madras, of four copies of the Report on the Cauvery Reservoir Project in Mysore, and also of the Appendices C, E and F referred to in the report dated 3rd April 1911 on the Reservoir Section by Mr. B. Subba Rao, Executive Engineer.

No. 69.—*Letter No. 601—3847, dated the 13th May 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

Adverting to Residency letter No. 2851, dated the 10th May 1913, I am directed

to forward herewith four copies of the Report on the Cauvery Reservoir Project in Mysore.

2. I am to add that Appendices C, E and F referred to in the letter under reply have not been printed and that the required copies will be duly supplied shortly, it being now arranged to get them printed.

No. 70.—*Letter R.O.C. No. 58-0--13, dated the 13th May 1913, from the Government of Madras, Public Works Department, to the Hon'ble the Resident in Mysore.*

I am directed to request that you will arrange to furnish this Government, at your earliest convenience, with information on the following points:—

(a) the number of miles of the Alalkatte gauging site, Chamraja Anikat and Sriramadevar Dam above the Mysore Cauvery Dam site,

(b) the daily gauge readings and corresponding daily discharges at the above gauging sites for the years referred to in enclosure (2) Discharge tables, to the *note dated 15th October 1910 on the Cauvery Reservoir Project in the Mysore State by the then Chief Engineer (the present Dewan) of Mysore,

*With special reference to its effect on the river supply in the Madras Presidency.

(c) a description of the anikat or dam at each of the two gauging sites,

(d) discharge formula in use,

(e) at what discharge or gauge reading in each case the anikat or dam becomes submerged.

(f) gauge readings below dam or anikat in each case, if these are taken.

No. 70 A.—*Letter No. 2940, dated the 15th May 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

A copy of the foregoing letter is forwarded to the Government of His Highness the Maharaja of Mysore, with the request that the information asked for by the Government of Madras may be furnished to this office at an early date.

No. 71.—*Letter R. O. C. No. 58-0—13, dated the 24th May 1913, from the Joint Secretary to the Government of Madras, Public Works (Irrigation) Department, to the Hon'ble the Resident in Mysore.*

I am directed to invite your attention to my letter No. 217-I, dated 21st April 1913, and to request that the information therein asked for may be provided at as early a date as possible.

2. As it is important that as much information as possible regarding discharges of the river at Sivasamudram should be collected, I am to inform you that the Superintending Engineer has been directed to erect gauges on the right or British branch of the river at Sivasamudram and to take daily readings during the coming flood season. The results of these readings will be submitted to you for communication to the Mysore Durbar. I am to request that similar information may be afforded with regard to the readings on the left branch of the river, gauges both above and below the anikat being fixed for the purpose, if they are not already in position.

No. 71 A.—*Letter No. 3178, dated the 26th May 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

A copy of the foregoing letter is forwarded herewith to the Government of His Highness the Maharaja of Mysore in continuation of this office No. 2534, dated the 24th April 1913, for favour of compliance.

No. 72.—*Letter R. O. C. No. 58-0—13, dated the 7th June 1913, from the Joint Secretary to Government, P. W. D., Irrigation Branch, to the Hon'ble the Resident in Mysore.*

In continuation of my letters No. 217-I, dated 21st April 1913, and R. O. C. No. 58-0—13, dated 7th and 13th May 1913, requesting to be furnished with information regarding certain gauge readings, discharges, etc., connected with the Mysore Cauvery Project, I am directed to forward herewith extract of note, dated 5th June 1913, by Colonel W. M. Ellis, R.E., Superintending Engineer, detailing the additional information to be supplied by the Durbar that will be necessary for preparing the case on behalf of the Madras Government to be laid before the Arbitrator. Intimation has since been received from the Government of India of their decision to refer to arbitration the questions relating to the effect of the Mysore Cauvery Project on the existing rights of this Government. As there is every probability of the arbitration commencing its sittings in the beginning of July next, I am to request that all the particulars already called for with the additional information now required by Colonel Ellis may be obtained and furnished at your earliest convenience.

2. Appendices C, E and F promised in para 2 of the Durbar's letter No. 601—3847, dated 13th May 1913, may also be supplied as early as possible.

3. I am also directed to enquire whether the Mysore Durbar require any additional information beyond that which has already been supplied and, if so, to request that it may be specified at a very early date.

No. 72A.—*Letter No. 3419, dated the 9th June 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing letter, with enclosure, is forwarded herewith to the Government of His Highness the Maharaja of Mysore, in continuation of this office letters No. 2534, dated the 24th April 1913, and Nos. 2851 and 2940, dated the 10th and 15th May 1913, respectively, with the request that the particulars already asked for and the additional information now required by Colonel Ellis may be furnished to this office as early as possible.

2. Attention is invited to paragraph 3 of the letter from the Government of Madras.

No. 73.—*D. O. letter No. 3471, dated the 11th June 1913, from the First Assistant to the Hon'ble the Resident, to the Dewan of Mysore.*

I am desired to invite a reference to the communications noted in the margin regarding the Mysore Cauvery Reservoir Project, and to request that the information desired therein may kindly be expedited.

1. Residency No. 2534, dated 24th April 1913.
2. ,, 2820, ,, 9th May ,,
3. ,, 2940, ,, 15th May ,,
4. ,, 3178, ,, 26th May ,,
5. ,, 3419, ,, 9th June ,,

The Madras Government are anxious to have the information as early as possible.

No. 74.—*D. O. letter dated Ootacamund, the 11th June 1913, from the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

Many thanks for your letter of the 7th. I am glad to hear your visit to Mangalore was satisfactory. I saw Sir Harold Stuart yesterday; he said he had also heard from you and I think he is very ready to do all that he can to assist.

I understood from Sir Harold Stuart that Colonel Ellis was not hopeful as to the results of his calculations in connection with your Cauvery proposals; but that he required further information from the Durbar. 'I communicated with Mr. Clerk in the matter and it appears that what the Madras Government want is the information for which we asked you in our letter No. 2534, dated the 24th April last, and in our endorsement No. 2820 of 19th May; also that which is indicated in three letters from the Madras Government all numbered 58-0-13 and dated 13th May, 24th May and 7th June, respectively.

I have my main file here, but these three letters (copies of which I have just received from Mr. Clerk) are not on it and must have gone to Bangalore. I have therefore just telegraphed to Mr. Warburton, asking him to give you the necessary indications and to invite you to do what is possible to expedite the information.

In a D. O. letter which I received last evening from Mr. Clerk he said " I am " replying to you officially with regard to the Dewan's proposals made at the Con- " ference. I am afraid that they would injure us and that we cannot accept them." Mr. Clerk's official letter will come to me here and I shall communicate with you promptly directly I have got it.

I at present intend to stay here till Monday or Tuesday but should be quite ready to stay longer if you thought there could be any advantage in my doing so. Please let me know about it.

I understand from Sir Harold Stuart that the Madras Government are preparing, or have actually prepared, their case for the Arbitrator (in the event of our having to go to arbitration), and that they will send me a copy very shortly for the information of the Durbar. I daresay you have also got your case ready, or will shortly have completed it, and that a copy of it will be furnished to Madras. Sir Harold did not, however, ask for this.

(Excuse errors due to haste for post).

No. 75.—*Letter C. No. 52, dated the 12th June 1913, from the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

I have the honour to forward, for the information of the Durbar, copies of two letters from the Government of Madras regarding matters connected with the storage of the Cauvery waters.

R. O. C. No. 106-0—13-1, dated 11th June 1913.
R. O. C. No. 106-0—13-2, do

No. 75 A.—*Letter R. O. C. No. 106-0—13-1, dated the 11th June 1913, from the Joint Secretary to the Government of Madras, P. W. D., Irrigation Branch, to the Secretary to the Government of India, Public Works Department.*

With reference to the latter portion of your telegram No. 813-I, dated 2nd June 1913, in which it is stated that the exact date of meeting and terms of reference to arbitration with the Mysore Durbar regarding their proposed reservoir will be decided later, I am directed to bring to your notice that up to this date the reasons for which the Madras Government have felt unable to assent to the construction of the Mysore Reservoir have not as yet been fully set forth.

2. Colonel Ellis, in his letter No. 394-I, dated 15th November 1910, printed at pages 17-36 of this Government's Order No. 427-I, dated 23rd December 1910, put forward certain requirements for the purpose of preparing tables to show how the proposals of the Mysore Durbar would affect British interests. These were an absolute minimum adopted by Colonel Ellis in order that there might be no dispute about the conclusions deduced from them. In order to prevent misunderstanding, the Governor in Council deems it expedient to state at once that the demands which he puts forward for the protection of the existing Cauvery irrigation in this Presidency are as follows:—

(1) A discharge equivalent to the normal discharge due to a depth of 7 feet on the Cauvery Dam gauge at the Upper Anikat.

(2) This discharge to be measured on the Cauvery and its tributaries immediately above waterspread of the Kannambadi Reservoir and at a station on the Kabbani river about 40 miles above its junction with the Cauvery.

(3) A right to call for an additional quantity of water for 30 days in any year. (This claim is based on existing practice in past years since the Upper Anikat has been remodelled.)

(4) The quantity of water actually required to fill Veeranam tank of the Lower Coleroon Anikat System.

(5) A percentage allowance to make up for losses by transmission on all waters passed down between the reservoir at Kannambadi and the Upper Anikat.

2. I am to add that a copy of this letter is being sent to the Hon'ble the Resident in Mysore for communication to the Mysore Durbar.

No. 75 B.—*Letter R. O. C. No. 106-0—13-2, dated the 11th June 1913, from the Joint Secretary to the Government of Madras, P. W. D., Irrigation Branch, to the Hon'ble the Resident in Mysore.*

With reference to the proposals put forward by the Dewan of Mysore at a Conference held on Friday 30th May, I am directed to state that the effect of the proposed rules for working the projected Mysore Cauvery Reservoir has been examined by the Engineers of this Government and that their conclusions based on such information as is now available are that excluding surpluses the amount of water reaching the Upper Anikat, would be reduced in quantity and would also fluctuate from day to day to a greater extent than it does under existing circumstances. They also find that in the year which they have examined the projected reservoir would fail.

In these circumstances, I am to state that this Government regret that they are unable to accept the suggestion put forward.

No. 76.—*Letter C. No. 35-61, dated the 16th June 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

With reference to para 1 of the Madras Government letter No. 58-0 – 13, dated the 7th June 1913, forwarded with the Residency Endorsement No. 3419, dated the 9th idem, intimating that the Government of India have decided to refer "the questions relating to the effects of the Mysore Cauvery Project on the existing rights of the Madras Government" for arbitration very shortly, I am directed to state that the Durbar are arranging to prepare their case.

2. For this purpose some further information, in addition to what has been already supplied, is necessary to enable the Durbar to understand how the stipulated discharge of 7 feet at the Cauvery Dam is now made up. I am to attach a statement showing the details of the information to be prepared from the Madras records. I may add the Madras Government have, in paragraph 3 of their letter quoted above, kindly expressed their willingness to supply such information.

3. I am to request that the Hon'ble the Resident will kindly move the Madras Government to supply the information needed at as early a date as may be feasible.

No. 77.—*Letter C. No. 34-60, dated the 16th June 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

Referring to Residency Letter No. 2534, dated the 24th April 1913, I am directed to forward herewith a statement of the daily discharges on which were based the half-monthly totals given in Statement A that accompanied the note of February last by the Officiating Chief Engineer of Mysore.

2. As regards para 2 of the letter under reply, I am enclosing a brief memorandum describing the methods and formulæ by which the discharges were computed.

It will be observed from the remarks of the Officiating Chief Engineer that the methods of gauging adopted by the Chief Electrical Engineer are somewhat rough so far as the flood season is concerned though they give fairly accurate results for the dry season when such gauging is important for power purposes.

No. 78.—*Letter No. 747—4929, dated the 18th June 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

In continuation of this office No. 601—3847, dated the 13th May 1913, forwarding four copies of the report of the Cauvery Reservoir Project in Mysore, I am directed to forward herewith four printed copies each, of Appendices C, E and F referred to in paragraph 2 thereof.

No. 79.—*D. O. letter dated the 18th June 1913, from the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

Enclosed is copy of the Government of India's telegram as to terms of reference to the arbitration.

They ask me, unless arrangements can be reached without arbitration, to ascertain whether the Mysore and Madras Governments accept the above terms.

I will make an official reference to you later, if necessary and if you so desire, but send this now to save time.

No. 79 A.—*Substance of telegram from the Government of India, dated and received 18th June 1913.*

If recourse is had to arbitration in the Cauvery case, the following terms of reference are proposed:—

(*a*) Whether, in view of the rules published with the Madras Government's G. O. No. 162-I, dated the 18th February 1892, the Mysore Government are entitled to impound any part of the waters of the Cauvery over and above the amount agreed to in para 2 of the Madras Government's letter to the Resident in Mysore, dated the 23rd September 1911.

(*b*) If so, what proportion of the available supply is the Mysore State entitled to impound and on what conditions.

No. 79 B.—*D. O. letter dated the 17th June 1913, from the Hon'ble Sir Harold Stuart, to the Hon'ble the Resident in Mysore.*

I passed the draft of an official letter to you this morning and ordered that it should be despatched in time to reach you by this evening at latest. We have suggested that Mysore should make other proposals but we are ready to do so also when we receive the detailed statistics for which we have asked. That is implied in the concluding sentence of our letter. I am not sanguine of our being able to avoid arbitration but I should be very glad to do so if it is possible. In any case, this recent exchange of views and proposals must tend to expedite the arbitration proceedings.

No. 79 C.—*Letter R. O. C. No. 106-0—13-5, dated the 17th June 1913, from the Joint Secretary to Government, P. W. D., Irrigation Branch, to the Hon'ble the Resident in Mysore.*

With reference to your recent conversation with the Hon'ble Sir Harold Stuart and in continuation of my letter R. O. C. No. 106-0—13-2, dated 11th June 1913, and also with reference to your letter No. C. 51, dated 10th June 1913, I am directed to afford further details with regard to the effect of the rules proposed by the Dewan of Mysore on the water-supply reaching the Upper Anikat. In the absence of detailed information as to the way in which the receipts in the Kannambadi Reservoir have been arrived at and of the admittedly incorrect calculations of discharges at Sivasamudram during high floods, various assumptions have been made to eliminate as far as possible obvious errors.

The years 1904-05 and 1905-06 have been taken and it has been ascertained that in the year 1905 a quantity of water amounting to 3,243 millions cubic feet which would have been called by Madras would have been surplused owing to floods

which could not have been foreseen when the call was made, and that Tanjore would also have lost 5,000 millions cubic feet which would have passed into the delta under the present system and have been used for irrigation. In addition to this it is found that the daily discharges at the Upper Anikat would be made to *fluctuate* in a way which would render regulation for irrigation very difficult.

2. The above results have been arrived at taking into consideration the proviso proposed by the Dewan that Madras call lapses if the reservoir surpluses by the amount at call. As there does not appear to be any justification for this stipulation, the case has also been considered with this proviso omitted. The result shows that the daily fluctuations would be as before and that the same amount, *viz.*, 3,243 millions cubic feet which would otherwise have been used by Madras would have been surplused, but that the loss of 5,000 millions cubic feet would not have occurred. On the other hand, it is shown that the Mysore reservoir would have run dry on the 4th May 1906.

3. The results of the rules on the discharges in the other year (1902) have also been examined and it is found that in one flood a loss of about 6,000 millions cubic feet to Tanjore would occur. In view of the admittedly uncertain data on which these investigations have been made, it is considered useless to forward the bulky working tables from which the above results have been deduced. They are sufficient to show that under the proposed rules Madras would lose not only in total quantity of water but in the way in which it is received.

4. With regard to para 2 of your letter No. C. 51, dated 10th June 1913, I am to state that His Excellency the Governor in Council will be happy to consider any proposals which the Durbar may put forward to render arbitration unnecessary but that he considers that those proposals should be definite ones and should be accompanied by tables proving that our present supplies will not be affected and also by full details explaining how the figures of discharges adopted by the Mysore Government have been arrived at. In the absence of these latter figures, it is impossible for this Government to suggest any workable scheme.

No. 80.—*Letter C. No. 40—68, dated the 26th June 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

With reference to letter No. 580—13 from the Government of Madras, dated the 7th May 1913, forwarded with the Residency Endorsement No. 2820, dated the 9th idem, asking for further statements with regard to the gauges, etc., at Sivasamudram, I am directed to forward herewith a book containing the Daily Gauge Readings and Discharges at Sivasamudram. Column 9 of the statement shows the daily discharge in the Power Works channels. The discharges at Sivasamudram Anikat, as shown in the statement A attached to the note of February last, by the Officiating Chief Engineer of Mysore, include the quantities of water used for Power Works also.

2. In this connection I am to invite a reference to paragraph 2 of this office C. No. 34—60, dated the 16th June 1913.

3. I am to add that the sluice information called for is being collected and will be forwarded shortly.

No. 81.—*D. O. Letter dated 24th June 1913, from the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

This morning's post, just in, has brought me a letter from Mr. Clerk in which he says:—

"It is observed that the discharges furnished by the Mysore Durbar cease in all cases with the year 1909. I am to request that you will arrange with the Durbar for furnishing the information in all cases up to the end of the year 1912."

No. 82.—*Letter C. No. 41—69, dated the 27th June 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

With reference to Residency letter No. 3178, dated the 26th May 1913, I am directed to state that it is very desirable, as suggested by the Madras Government, to make effective arrangements to gauge the discharge of the Cauvery river and that the necessary gauging point may be preferably a little below, rather than at, Sivasamudram itself.

2. The river section at Sivasamudram is wide and irregular and is not suited for adoption as a gauging station particularly in the flood season. The Durbar consider that it would be advisable to fix the gauge site below the junction of the river with the Arkavati, somewhere in the reach marked A B on the accompanying sketch tracing. Steps are being taken accordingly and the arrangements finally approved will be communicated to the Madras authorities.

3. I am to add that the gauging at Sivasamudram was started in 1902 mainly to measure the water required for power purposes during the dry season and was not intended for measuring flood discharges. There is, however, no objection to fix the gauges at Sivasamudram as proposed by the Madras Government as the observations would serve as a check on the gauging to be started at the lower point mentioned above.

No. 83.—*Letter C. No. 89, dated the 28th June 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

With reference to Mr. Karpur Shrinivasrav's letter No. C. 35—61, dated the 16th June 1913, I am directed to say that it will take some time for the Government of Madras to furnish the daily discharges of the Cauvery river called for by the Durbar.

2. I am, however, to forward herewith—

(i) Annual diagrams showing draw-off of Pallapoliem and Kalingarayan Anikats and discharges of the former for the 20 years—1890 to 1909—which are available and may be of use to the Durbar;

(ii) a sketch map showing position of anikats; and

(iii) a statement showing the area of irrigation under the last anikat on the major tributaries of the Cauvery and under the channels taking off the river above the Upper Anikat.

3. I am to point out that the Kalingarayan discharges can only be considered as approximations owing to the irregularity of the anikat and to ask that the annual diagrams may be returned when done with as they are the only copies available in the office of the Chief Engineer for Irrigation, Madras.

No. 84.—*Letter C. No. 90, dated the 28th June 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

With reference to Appendices C, E and F forwarded with Mr. Karpur Shrinivasrav's letter No. 747—4929, dated the 18th June 1913, I am directed, at the instance of the Government of Madras, to request that the Resident may be favoured at an early date with a map showing (*a*) the position of all rain gauge stations mentioned for which tables of rainfall are sent and (*b*) the position of all anikats and measuring stations used in the calculation of flood discharges.

No. 85.—*Extract of letter No. 58-0—13-12, dated the 24th June 1913, from the Hon'ble Mr. H. E. Clerk, Joint Secretary to the Government of Madras, Public Works Department, Irrigation Branch, Ootacamund, to the Hon'ble the Resident in Mysore, Bangalore.*

* * * * * * *

2. In the memo on the method adopted for gauging the river flow at Sivasamudram Anikat that accompanied your letter No. 3561, dated 17th June 1913, it is

said that sluice discharges are calculated by the formula D equals 5 A $\sqrt{h}$, but it is not stated how 'h' is ascertained for the sluice in the Kollegal Anikat and for the scouring sluice in the main anikat. It is presumed that both have been calculated as if with a clear run-off, and, as regards the channel discharge, it is understood that 'h' is computed from the levels shown by fixed gauges above and below the head sluices.

As regards the discharges of Kollegal Anikat and the irregular rocky bed beyond it, it is said that the formula used is 214/60 $h\sqrt[3]{}$, but nothing is said as to how 'h' is fixed over the irregular rocky bed nor has the section of the same been furnished. I am therefore to request that the information as to how 'h' is determined in each of the above cases may be arranged to be furnished as early as possible with the section of the irregular rocky bed beyond the Kollegal Anikat. I am also to request that the gauge readings at each branch of the anikat asked for in my letter R. O. C. No. 58-0—13, dated 7th May 1913, may be supplied at a very early date.

No. 85 A.—*Letter C. No. 91, dated the 28th June 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

The foregoing extract is forwarded herewith to the Government of His Highness the Maharaja of Mysore for information, with reference to Mr. Karpur Shrinivasrav's letter C. No. 34—60, dated the 16th June 1913, with the request that the information required by the Madras Government may be furnished to this office at an early date.

No. 86.—*Letter R. O. C. No. 58-0—13-13, dated the 27th June 1913, from the Joint Secretary to Government, Public Works Department, Irrigation Branch, to the Hon'ble the Resident in Mysore.*

In continuation of para 2 of my letter dated 24th May 1913 regarding the erection of gauges for taking daily readings during this flood season, I am directed to inform you that arrangements have been made by Colonel Ellis to erect two gauges, one near the nose of the island above the Sattegal (Dhanakarai) anikat and another below it and to have the readings recorded daily during the flood season.

No. 86 A.—*Letter No. 3791, dated the 30th June 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing letter is forwarded herewith to the Government of His Highness the Maharaja of Mysore for information in continuation of this office endorsement No. 3178, dated the 26th May 1913.

No. 87.—*Letter No. 801—5230, dated the 1st July 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

With reference to letters Nos. R. O. C. 58-0-13, dated 13th May 1913, and R. O. C. 58-0-13, dated 7th June 1913, from the Government of Madras, Public Works Department, to the address of the Hon'ble the Resident, forwarded with your endorsements Nos. 2940, dated 15th May 1913, and 3419, dated 9th June 1913, respectively, I am directed to forward herewith the following documents as required by the Madras authorities—

ALALKATTE DAM.

One book containing gauge readings and discharges.
A memo containing information called for.
A tracing of the site plan.

SRI RAMDEVAR DAM.

One book containing gauge readings and discharges.
A memo containing necessary information.
A tracing of the site plan.

SIVASAMUDRAM DAM.

The Gauge Reading and Discharge Table Book was already sent with this office C. No. 60—68, dated 6th June 1913.

A memo containing necessary information.
A tracing of the site plan.

II. Other information called for in the above two references is being collected and will be furnished shortly.

MEMO ON THE ALALKATTE OR CHAMARAJA ANIKAT.

Reference.—Letter No. R. O. C. 58-0—13, dated 13th May 1913, Para 1.

(*a*) Chamaraja Anikat is another name for the Alalkatte; this is 29½ miles above the Kannambadi Dam site.

(*b*) Book B enclosed, gives all the details of daily gauge readings and discharges for the years 1896 to 1909 referred to.

(*c*) This anikat is in the form of a bow, convex towards the upstream side; it is a masonry anikat, trapezoidal in section, with a batter on the front face and vertical on the rear. A length of 620′ of the anikat from its left flank has its crest at R. L. 2598·50 and the remaining 48′ at R. L. 2595·68. At the left end of the anicut, there is a scouring sluice of 6 vents of 4′ × 5′ with cill at R. L. 2584·00 and a head sluice of 5 vents 5′ × 6′ with cill at R. L. 2588·00; the latter to supply water for irrigation under the Chamaraja channels.

(*d*) The formulæ adopted for the calculations of discharges are—

(i) For spillage ove the anikat :—

$Q = 3{\cdot}1\ L.\ H.\ \sqrt{H}$ where Q is the discharge in cusecs, L is the length in feet measured on the dam crest and H is the full depth of spillage in feet over the anikat.

(ii) For discharge through the head sluice:—

$Q = 8\ A\ \sqrt{2\ g\ H}$ where Q is the discharge in cusecs, A is the area of vents open, and H the difference of water level between the front and rear of the head sluice vents, there being a gauge at the back of the sluice.

(iii) For discharge through the scouring sluices the same formula as in (ii) is adopted.

(*e*) & (*f*) Gauges of tail water over crest of dam have not been maintained and are not available except in high floods; there is a free overfall discharge and the effect of back water in floods is to some extent made up by the velocity of approach which has not been now accounted for.

Reference :—No. R. O. C. 58-0-13, dated 17th June 1913.

PARA A-1.

(2) The daily gauges are recorded every morning at 8 A.M.

(5) The site plan and the course of the river above and below is enclosed (*vide* tracing D).

(6) A typical cross section of the anikat is noted on the above tracing with the maximum flood level marked thereon.

MEMO ON THE SRI RAMDEVAR DAM

Reference:—*No. R. O. C. 58-0—13, dated 13th May 1913, para 1.*

(*a*) The Sri Ramdevar Dam is about 69 miles above the Kannambadi Dam site along the river bed.

(*b*) Book C enclosed, gives all the details of daily gauge readings and discharges for the years 1893 to 1909 referred to.

(*c*) (1) This anikat is of masonry, built straight across the river and in section it is trapezoidal with a batter on the front face and nearly vertical on the rear.

(2) The free overfall length of the anikat is now 832 feet. It was 844 feet clear between the head walls of the scouring sluices till very recently, *i.e.*, till after 1909. The calculations given in the discharge statements have been based on the free length of 844 feet. The crest is at one uniform level, with a counter slope of 1 foot from front to rear.

(3) There are two head sluices, one at the head of each channel—the north sluice having 10 vents of $3\frac{1}{2}' \times 4\frac{1}{8}'$, with cill at 5′ below crest, and the south having 4 vents $2' \times 2\frac{1}{2}'$, with cill at $3\frac{1}{2}'$ below crest supplying water for irrigation and there is a scouring sluice of 4 vents of $3' \times 3'$ at the left end of the anikat, close to the north head sluice with cill at $9\frac{1}{4}'$ below crest.

(*d*) The formulæ adopted for the calculation of discharges at the Sri Ramdevar Dam are:—

(i) For spillage over the anikat:—

Q equals 3·1 L. H. $\sqrt[3]{}$ where Q is the discharge in cubic feet per second L is the length of weir in feet and H is the head gauged over crest in feet. The dam is never submerged.

(ii) For discharges through head sluices:—

Q equals ·625 A$\sqrt{2\ gH}$ equals 5 A$\sqrt{H}$ where Q is the discharge in cusecs, A is the area of vents opened and H is the effective head or difference between the levels of water in front and rear of the vents, there being a gauge at the rear of the sluice in each case.

(iii) For discharges through scouring sluices:—

the same formula as in (ii) above is adopted, but H is measured from the centre of the vents opened to the surface of water in front as the discharge takes place into free air.

Reference:—*R. O. C. No. 58-0—13, dated 7th June 1913.*

Para A.

(*e*) and (*f*). Tail Water Levels not maintained nor Necessary.

(2) The daily gauges are recorded every morning at 8 A.M.

(5) The site plan and the course of the river above and below is enclosed (*vide* tracing E).

(6) A typical cross section of the dam is noted on the above tracing with the flood level marked on it.

MEMO ON THE SIVASAMUDRAM ANIKAT.

Reference:—*No. R. O. C. 58-0—13, dated 7th June 1913.*

Para III.

Of Col. Ellis' Note dated 5th June 1913.

(1) and (3).—Gauge Reading Book A already sent with this office C. No. 60-68, dated 6th June 1913, gives these details of daily discharges and gauges.

(2) Gauges are taken daily at 7-30 A.M. and the distance of this site below the Kannambadi Dam site is $59\frac{1}{2}$ miles along the river.

(4) These details of formulæ and methods adopted for calculations have been furnished in the memorandum sent with this office C. No. 34-60, dated 16th June 1913. No velocities of approach nor the tail water levels have been taken into account in calculating the discharges. There is a surface fall of nearly 1 in 300 in high floods and this gives a good velocity of approach which, to some extent, makes up for the omission of the tail readings.

NOTE.—With regard to the difference in the heads at the two branches, the main anikat and the Kollegal branch 7·4 and 11 feet referred to, it will be seen from the tracing E enclosed, that the main anikat marked (*a*) and the Kollegal Anikat with its extensions marked (*d*) and (*e*) are located about 3,400 feet apart and there is a considerable fall in the bed of the river from the site of the Kollegal Anikat to that of the main anikat. Consequently, the depths gauged over the two branches differ. The depths gauged daily over the different branches are recorded in columns 2, 4 and 6 of Gauge Book A, referred to in para (1) above.

As observed, these gauge records were maintained by the Electrical Department with a view to calculate the discharges of the river in the dry season rather than to have any accurate discharge of the river during floods and they are consequently rough.

(5) A site plan with the general course of the river above and below is found in the tracing E enclosed.

(6) No typical cross sections of this anikat are available. The highest flood over the anikat is shown on the tracing in the marginal notes.

No. 88.—*D. O. letter dated 24th June 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

Will you kindly refer to your demi-official letter No. 686, dated the 12th instant, regarding the Cauvery Reservoir Project?

No. 58-0—13, dated 7th May 1913.
" " 13th May 1913.
" " 24th May 1913.
" " 7th June 1913.

The Government of Madras have again desired the Resident to expedite all the information asked for in their letters. Sir Hugh knows that everything possible is being done to get the information ready promptly; but Madras have now suggested that such portions of the information as are actually ready might be supplied at once.

The information asked for in paragraph 2 of Mr. Karpur Shrinivasrav's letter No. 35-61, dated the 16th June 1913, is being collected by the Government of Madras.

No. 89.—*Telegram dated 1st July 1913, from the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

Madras telegraph they cannot accept your proposed scheme as it might seriously affect their existing irrigation—they would prefer proceeding to arbitration without delay and suggest that Griffin who would commence proceedings on sixteenth should sit at Ootacamund. I shall be glad to see you early after your arrival.

No. 90.—*Demi-official telegram from Madras Irrigation, to the Hon'ble the Resident in Mysore, dated and received the 1st July 1913.*

Your D. O. letter June 27th Cauvery Reservoir. We cannot accept Dewan's proposed scheme because rough tables prepared by us on data available show conclusively that supply would give us less than our requirements to serious detriment of our existing irrigation. Our objection to Mysore Reservoir must therefore be maintained. Further personal conference unlikely to be fruitful and we should prefer to proceed to arbitration without delay. If Mysore wishes to make further proposals, it will probably secure a more speedy settlement if these are laid before the Arbitrator. Sir H. Griffin can commence proceedings on 16th July and we suggest that he should sit at Ooty. We have not yet received from India the terms of reference to which we allude, we shall be glad to receive immediately

further statistics promised by end of June and we will send you shortly detailed reply to Dewan's letter No. 838, dated 31st March.

No. 91.—*D. O. letter dated the 4th July 1913, from the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

I enclose a copy of a telegram which I received this morning from the Madras Government.

The terms suggested in my letter No. C. 88 of the 27th June, were:—

(1) What is the quantity of water required for the protection of the Madras Government's prescriptive rights, as already acquired and actually existing when the said Agreement of 1892 was made?

(2) How should the flow be measured and regulated in order to secure the due performance of their obligations by the Durbar?

(3) In what manner can the protection of the Madras Government's prescriptive rights be secured with the least injury to Mysore?

Perhaps we might talk the matter over and then I could telegraph to the Government of India and to Madras.

No. 91 A.—*Copy of a telegram from the Government of Madras to the Government of India in the P. W. D. No. 4-0, dated the 3rd July, repeated to Resident, Mysore, as No. 5-0; received 4th July.*

Your telegram 977-I. 2nd, Madras Government propose terms of reference be first, what is the quantity of water to which Madras is entitled for requirement of existing irrigation both above and below Upper Anikat and which should during the different months of the year be passed down by Mysore before impounding at Kannambadi Reservoir; second, in what manner and at what point of the river should measurement be made of the discharge which is to be passed down before the Mysore Government begins to impound; third, does the decision on the foregoing points justify the refusal of the Madras Government to assent to the construction of the reservoir as projected by the Durbar.

Letter follows.

The Madras telegram to me, after repeating the above message, proceeds as follows:—

Proposal in item (i) of terms proposed by Mysore in Resident's letter C. 88 of 27th June, limiting our rights to those existing at the time of the Agreement of 1892, is an unwarrantable addition to the Agreement of 1892, and proposal in item 3 is objectionable, as it is not for the Arbitrators to find best means for Mysore to utilise water available. Proposed terms cannot therefore be accepted.

No. 92.—*Letter No. C. 106-0—13-7, dated the 2nd July 1913, from the Joint Secretary to the Government of Madras, P. W. D., Irrigation Branch, to the Hon'ble the Resident in Mysore.*

With reference to the proposed arbitration regarding the Cauvery Reservoir in Mysore, I am directed to inform you that it is reported that there is an anikat in Mysore across the Cauvery about 1½ miles below the site of the Kannambadi Dam, and to request that this Government may be informed whether it is correct.

2. If it is so, I am to request that the Mysore Durbar may be asked to be kind enough to supply a statement of gauge readings and daily discharges at this anikat if they are available.

If gauge readings and discharges are not available, it is requested that this Government may be informed why advantage was not taken of the existence of this anikat to get reliable discharges so close to the dam site.

No. 92A.—*Letter No. 3888, dated the 5th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing letter is forwarded herewith to the Government of His Highness the Maharaja of Mysore, with the request that the information required by the Madras Government may be furnished to this office at an early date.

No. 93.—*Letter No. 58-0—13-17, dated the 3rd July 1913, from the Joint Secretary to the Government of Madras, P. W. D., Irrigation Branch, to the Hon'ble the Resident in Mysore.*

In continuation of my letter No. 58-0—13-12, dated the 24th June 1913, I am directed to forward herewith a copy of a note by Col. Ellis, Superintending Engineer on Special Duty, dated the 1st July 1913, on the Noyel Anikat, with a plan of level sections and a sketch plan of the anikat, and to add that except in heavy rains the discharge of the Noyel river is negligible.

2. The extent of Madras lands irrigated by the channels from the Cauvery above the Bhavani bridge is 792 acres as detailed below:—

	Acres.
(i) Sattegal channel under Dhanakarai Anikat about 7 miles above Sivasamudram...	664
(ii) Sivasamudram channel in the Kollegal branch of the Cauvery below Mysore Power Works	128

The draw-off of these channels is very varying and has not been measured and the quantity of water drawn-off cannot be stated.

No. 93A.—*Letter No. 3909, dated the 5th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing letter, with enclosures, is forwarded herewith to the Government of His Highness the Maharaja of Mysore.

No. 93 B.—*Copy of Note.*

The Noyel Anikat shown in the plans and sections with sketch site plan enclosed is built with a view of carrying the water of Pugalur channel across the Noyel in a level crossing. There is no gauge either above or below the anikat and water levels are not recorded. The Pugalur channel has its head in the right margin of the Cauvery above the confluence with the Noyel while all the ayacut (2,010 acres) is below. Hence the necessity for the anikat.

While it is probable that the channel may occasionally get a little Noyel water, this is uncommon as, except in time of heavy rain and high fresh, Noyel water, as a rule, does not reach the tail of the channel.

The Pugalur channel is a Cauvery channel. It gets, however, some water from the Bhavani through the tail of Kalingarayan channel which outfalls into the Noyel above the Noyel Anikat. The flood level of the Cauvery is much higher than any flood recorded due to Noyel freshes.

The former is stated to be 8·11 ft. above the Noyel Anikat crest whereas the level due to the maximum flood in the Noyel is stated to be 4 ft. over the crest.

No discharges of the anikat or of Pugalur channel have been recorded and no information on the subject of the discharges is available.

No. 94.—*Letter No. 823—5408, dated the 7th July 1913, from the Secretary to the Government of Mysore, P. W. D., to the First Assistant to the Hon'ble the Resident in Mysore.*

I am directed to request you will be so good as to obtain for the Durbar from the Madras Government by wire, if convenient, three more sets of the reports in connection with their new Cauvery Reservoir Project.

2. I am also to invite reference to D. O. letter, dated the 11th June 1913, from the Residency, stating that a copy of the case for arbitration, prepared by the Government of Madras, will be sent as soon as it is ready, and to solicit that the Government may kindly be moved to expedite the despatch of this document to enable the Durbar to prepare their case.

No. 95.—*Letter No. 106-0—13-10, dated the 6th July 1913, from the Joint Secretary to the Government of Madras, Public Works Department, Irrigation Branch, to the Hon'ble the Resident in Mysore.*

With reference to letter No. 838 Pol., dated the 31st March 1913, from the Dewan of Mysore, received with your letter No. C. 27, dated the 1st May 1913, I am directed to offer the following remarks on the points taken by the Dewan :—

2. The statements of half-monthly discharges at Sivasamudram furnished by the Mysore Engineers indicate frequent losses in transmission between Sivasamudram and Bhavani bridge in the half-monthly periods for which the tables prepared by the Chief Engineer, Mysore (accompanying the above letter), are drawn up. For instance, in the half months of June to September 1901-1909, the half-monthly flow at Bhavani bridge is less than that at Sivasamudram in 55 half months out of a total of 72, while during the bad years 1904-1905-1908 the half-monthly flow totals during these months show in every case without exception a loss in transmission between Sivasamudram and Bhavani bridge. Thus, far from the clearly drawn tables of the Chief Engineer, Mysore, proving that there is no great loss in transmission, they emphasize the constant occurrence of such losses, and show that they are specially heavy and continuous in the bad years.

While occasional gains in transmission are realised, the reverse occurs with great frequency and it is not possible to forecast when a gain will be realised.

In order to safeguard Madras supplies under such circumstances, it is necessary to make provision for a loss throughout the period of years in which the liability to such loss is shown to exist to a material degree.

3. The original figures put forward by Colonel Ellis and accepted by this Government as a suitable basis for working tables, and for discussion, were based on the discharges at Bhavani bridge and the Upper Anikat, and the claims made for losses in transmission were based on a comparison of these discharges. This was admittedly an unsatisfactory basis, but the figures were the best available when the case was drawn up, in the absence of a table of discharges at Sivasamudram. The assumption then made was that the discharges at Bhavani bridge and at Sivasamudram were the same, that is, that there was no loss in transmission between these places. The tables supplied by the Chief Engineer, Mysore, show this assumption was altogether unjustified, and the fact is, that, during the south-west monsoon, the losses between Sivasamudram and Bhavani bridge are frequent and great, and in bad years almost continuous.

The statistics of the discharges at Sivasamudram now available are more material to the question than those at Bhavani bridge and consideration and comparison on this basis have induced this Government to modify the claims made for losses in transmission so as to include the whole period of the south-west monsoon, June to September, and to exclude the north-east monsoon period and the rest of the year. This modification was communicated to the Dewan at the meeting to discuss this question held at Ootacamund on 29th May 1913.

4. The error pointed out in paragraph 3 of the Dewan's letter is admitted; the figure should be 23 and not 40 per cent. The error, however, does not materially affect the question, or the claims of Madras, especially in view of the new data on which the revised proposals are based, from which the discharges at Bhavani bridge are eliminated.

5. It is not denied that there is material inflow from the Bhavani river, and, were it not so, the claims for loss in transmission would have to be correspondingly increased. The inflow from Bhavani, while generally material, is much reduced in bad years and it frequently happens that the draw-off for the 96,000 acres of direct irrigation between its confluence with the Cauvery and the Upper Anikat, added to

Erroneously stated as 61,000 acres in previous correspondence.

the natural loss in transmission from percolation, etc., is materially greater than the inflow from the Bhavani and other tributaries in its length of river. In such cases the flow at the Upper Anikat will be less than that at Bhavani bridge.

The daily discharges available give a record showing when such conditions have actually obtained in past years.

With the exception of the Bhavani, the inflow of tributaries, such as the Noyel and Amaravati, in the bad years is very small.

6. As regards the Dewan's paragraph 4, it is believed that this refers to the rules for impounding the Mysore reservoir and for issue of water for Madras, which were an enclosure to the letter of the Dewan, No. 11 Camp, dated the 10th May 1912. The effect of these rules has been already examined and the result was communicated in paragraph 4 of letter No. 343—I, dated the 30th August 1912. The examination showed that under the rules a material diminution in the water available for irrigation in Madras would be caused, while in addition, the amount of water which could be impounded in the Mysore Reservoir was also materially less than it would be under the rules proposed by Madras, so far as could be judged with the inadequate information in the hands of this Government.

The operation of the rules has also the effect of making still more irregular the already irregular discharges received by Madras.

The statement that the Mysore Reservoir could be utilised to make flow more steady is admitted to be correct, but is not material unless the rules for regulating the impounding are such as will have this effect. The calculations that have been made show conclusively that the rules proposed by the Durbar will not have this result.

7. The proposed rules therefore do not commend themselves to this Government. The rules which they put forward were embodied in letter R. O. C. No. 106-0—13-1, dated the 11th June 1913, to the Government of India, a copy of which was communicated to you with letter No. 106-0—13-3, dated the 11th June 1913. It should, however, be added that the claim to loss in transmission is only made for the months June to September.

These rules provide for measuring discharges above the Kannambadi Reservoir and also at a selected site on the Kabbani. It is agreed that the gauging of discharges at Sivasamudram is likely to prove unsatisfactory. For purposes of calculation and the preparation of working tables it is, however, necessary to consider the discharges at Sivasamudram, these being the only statistics available recording the flow of the Cauvery in Mysore.

8. As regards the impounding in February, the object sought is that the natural flow of the river should be passed down unimpaired throughout that month. As the water which is issued from the Mysore Reservoir *for power* will be available for Madras use, it is considered fair to allow impounding during February from the flow of the Cauvery above Kannambadi up to the extent of the total flow or the amount of water issued from the reservoir for power, whichever is less.

9. This Government do not understand on what grounds it is considered that any of the benefits of the economies which may be effected in the distribution of water to the existing irrigation areas by the construction of a Madras reservoir on the Cauvery should be transferred to Mysore as is suggested in paragraph 7 of the Dewan's letter, and are altogether unable to accept the suggestion for the reconsideration of any agreement which may be come to in the event of the construction of a reservoir or any other works in Madras.

10. The regulation of impounding in Mysore reservoir on the rules proposed by the Durbar, alluded to in paragraph 6 above, would affect the condition of supply to the Lower Coleroon Anikat system in an unfavourable manner as compared with the system of measurement in Mysore proposed by this Government, as the former would have the effect of materially reducing the number of times water would be passed through the Upper Anikat, and this water contributes to the maintenance of the irrigation under the Lower Anikat.

The requirements of the supply to the Lower Anikat system were not, however, the justification of the proposed 10 per cent addition to the quantity of water to be passed down. That addition was made to provide for losses in transmission.

11. This Government are advised that the rules advanced by the Mysore Durbar are not such as will secure to Madras irrigation the water to which it is entitled by prescriptive right already acquired and actually existing. The statements prepared on the basis of these rules show that both Madras and Mysore would be worse under them, than under the system of regulation suggested by Madras.

If the Mysore Durbar cannot accept this conclusion, it is for them to furnish to this Government clear and full tables showing, day by day, the effect on Madras supplies of the rules which they advocate. A mere statement that the rules provide for all the prescriptive rights of Madras cannot be accepted by this Government in the face of the above definite statements made by their professional advisers after detailed examination of the proposals. This Government have based their refusal to accept the Mysore proposals altogether on their "prescriptive rights already acquired and actually existing" and the matter of the Madras reservoir project does not arise in connection with this case.

No. 95 A.—*Letter No. 3993, dated the 8th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing letter is forwarded herewith to the Government of His Highness the Maharaja of Mysore.

No. 96.—*Letter No. 58-0—13-19, dated the 4th July 1913, from the Joint Secretary to the Government of Madras, Public Works Department, Irrigation Branch, to the Hon'ble the Resident in Mysore.*

In continuation of my letter No. 58-0—13-17, dated 3rd July 1913, I am directed to state that the Main Kalingarayan Anikat is 757 feet long with crest level +541. A section has not yet been furnished but it may be considered under all conditions of discharge as a broad crested anikat with clear overfall.

The Central Anikat is 863 feet long with crest +544·1 and 543·1.

The Murian Anikat is 1,340 feet long with crest about +542·9.

The conditions of discharge on these anikats do not allow of calculation of discharges. The water level in the river all along the crest is of varying depth while the conditions of run-off vary. No attempt is therefore made to calculate the discharges of this tail anikat on the Bhavani.

For low levels say up to 1¼ feet over the Main Anikat the flow is capable of calculation.

No. 96 A.—*Letter No. 3991, dated the 8th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing letter is forwarded herewith to the Government of His Highness the Maharaja of Mysore in continuation of this office Endorsement No. 3909, dated the 5th July 1913.

No. 97.—*Letter No. 58-0—13-20, dated the 5th July 1913, from the Joint Secretary to the Government of Madras, Public Works Department, Irrigation Branch, to the Hon'ble the Resident in Mysore.*

I am directed to acknowledge, with thanks, the receipt of your letter No. 3789, dated 30th June 1913, on the subject of discharges of the Cauvery river at Sivasamudram. This Government are informed that, as stated by the Secretary to Government, Public Works Department, Mysore, Sivasamudram, is unsuitable for the purpose of gauging any but small discharges. It is therefore highly desirable to decide on a gauging site in order to calibrate the gauges at Sivasamudram the readings on which are recorded for a series of years. The gauging station proposed

by the Durbar below the junction of the Arkavati would be useless for that purpose as catchments of about 5,000 square miles drain into the river between the points. As it is most important to graduate the gauges at Sivasamudram so that the readings available since 1901 may be of use, it is suggested that gaugings be taken at some suitable site as near as possible above Sivasamudram.

No. 97 A.—*Letter No. 3992, dated the 8th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing letter is forwarded herewith to the Government of His Highness the Maharaja of Mysore, with reference to Mr. Karpur Shrinivasrav's letter No. C. 41-69, dated the 27th June 1913.

No. 98.—*Letter No. 4041, dated the 10th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

With reference to Mr. Karpur Shrinivasrav's letter No. 823—5408, dated the 7th July 1913, I am directed to forward herewith three copies each of Volumes I, II and III of the Report on the Cauvery Reservoir Project of the Madras Presidency.

No. 99.—*Letter No. 58-0—13-21, dated the 8th July 1913, from the Joint Secretary to the Government of Madras, Public Works (Irrigation) Department, to the Hon'ble the Resident in Mysore.*

In continuation of my letter No. 58-0—13-19, dated 4th July 1913, I am directed to forward herewith a copy of note No. 33, dated 7th July 1913, by Col. Ellis on the Pallapoliem Anikat on the Amaravati, with enclosures in original as detailed in the margin, which it is requested may be returned when done with.

No. 99A.—*Letter No. 4070, dated the 11th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing letter, with enclosure, is forwarded herewith to the Government of His Highness the Maharaja of Mysore in continuation of this office Endorsement No. 3991, dated the 8th July 1913.

No. 99 B.—*Note, dated 7th July 1913, No. 33.*

PALLAPOLIEM ANIKAT ON THE AMARAVATI.

1. The anikat is 1,830* feet long, of irregular shape in plan. The crest level is +445·85. It is of rough stone with a masonry crest wall.

*Or 1,835 feet as noted on the sheets.

There is a sand sluice at the left flank which is regulated with needle shutters and is generally opened when the gauge above the head sluice reads 5 feet. The sand sluice has 3 vents 4 feet wide by 4½ high with cill level +438·35. The head sluice has 4 vents 4½ feet wide by 5 feet high with cill level +439·85.

The Thirumanilayur channel notch has a vent way of $1\frac{1}{2} \times 1\frac{3}{4}$ feet and cill of vent +441·1.

2. Enclosed is—

(*a*) Sketch map showing position of anikat; also 1 plan of anikat,

(*b*) 2 cross section sheets.

Enclosures.

1 map showing the position of Pallapoliem and Noyel Anikats.

1 plan of Pallapoliem Anikat.

2 section sheets of section of anikat.

1 set of statement of discharges of Pallapoliem Anikat and Channel for 1902 to 1910.

3. Forwarded also a statement of readings of gauges above the anikat and head sluice for the years 1902 to 1910 and a statement of calculated discharges of the anikat.

4. The discharges of the head sluice cannot be found. The only sheet of discharges forthcoming was calculated on an assumption of the afflux on the sluice. As the discharge depends altogether in such a case on the assumption made and as the gauge readings have almost invariably shown the same height of gauge above and below the sluice, I can only say the totals of discharges of the head sluice given in the annual diagram are of little value and no reliance can be placed on them.

5. No calculations or allowances have been made for the discharges of the sand sluice or the Thirumanilayur notch. The sand sluice is generally closed except when water stands at 5 feet or over on head sluice cill.

THE THIRUMANILAYUR SLUICE IS ALWAYS OPEN.

6. There are no gauge readings below the anikat. The discharges of this work are calculated as for a weir with clear overfall with formula $D=3{\cdot}1\ Lh\sqrt[3]{}$ and $D=3{\cdot}5\ Lh^{\frac{3}{2}}$ etc. The formula actually used in each case is noted on the sheet of discharges.

No. 100.—*Letter No. 58-0—13-22, dated the 8th July 1913, from the Joint Secretary to the Government of Madras, Public Works (Irrigation) Department, to the Hon'ble the Resident in Mysore.*

In continuation of my letter No. 58-0—13-20, dated 5th July 1913, I am directed to acknowledge, with thanks, the receipt of your letter No. 3790, dated 30th June 1913, forwarding a copy of letter C. No. 40—68, dated 26th June 1913, from the Secretary to the Government of Mysore, Public Works Department, with a book containing the daily gauge readings and discharges at Sivasamudram and to forward herewith a copy of note dated 7th July 1913, by Col. Ellis. on the discharges and gauge readings furnished by the Durbar. I am to request that the information required by Col. Ellis in his note may be arranged to be furnished as early as possible.

No. 100 A.—*Letter No. 4071, dated the 11th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing letter, with enclosure, is forwarded herewith to the Government of His Highness the Maharaja of Mysore, in continuation of this office Endorsement No. 3992, dated the 8th July 1913, with the request that the information required by Col. Ellis may be furnished to this office as early as possible.

No. 100 B.—*From Col. W. M. Ellis, R.E., Superintending Engineer on Special Duty, to the Chief Engineer for Irrigation.*

Reference.—Gauge readings and discharges, Sivasamudram, forwarded with letter No. 40—68, dated 26th June 1913, from the Secretary to Government, Public Works Department, and forwarded with Resident's No. 3790, dated 30th June 1913.

The results have now been examined and it is found that the discharges of the year 1901 do not conform or correspond in any respect with the lengths of weir and formulæ for calculating discharges communicated or with those of the subsequent years 1902 to 1909 which do so conform.

For the same gauge readings the discharges of 1901 are far smaller than in any other year.

No explanation of this has been given and it is requested, if these discharges are put forward as reliable, that full detail of the circumstances under which they were gauged and methods of arriving at the figures be communicated.

2. Reference, site plan, Sivasamudram, enclosed with letter from Resident, Mysore, No. 3838, dated 2nd July 1913, and undated not accompanying it.

It is pointed out that the positions are not marked of the gauges from which were read the depths of water:—

(*a*) Main Anikat.
(*b*) Kollegal Anikat.
(*c*) Kollegal Extension.

It is requested that the positions of each of these three or more gauges may be described.

It is noted that the depths of water over Kollegal Anikat do not differ by a constant from the depths over the Main Anikat and further that the depths over Kollegal extension do not differ by a constant figure from those over Kollegal Anikat. Thus there must have been three independent gauges and the positions of each are matters of considerable importance.

3. The section of Kollegal extension and the methods of computing lengths and depths of water in this section which are shown in the records of gauges and discharges should also be furnished.

It was asked that a few typical cross sections of the anikat at Sivasamudram should be furnished (*vide* Col. Ellis' Note, dated 5th June 1913, alluded to), but these have not been furnished.

4. As regards the site plans of Alalkatte Anikat and Sri Ramadevar Dam furnished with the above letter, it is remarked that the positions of the gauges on which the depths of water above the weirs were read are not shown on either of these places and to ask that the position be now described.

No. 101.—*Telegram No. 18-0, dated the 11th July 1913, from the Secretary to the Government of Madras, Public Works Department, Irrigation Branch, to the Resident in Mysore.*

Please arrange with the Durbar to furnish for reference by Madras officers during the arbitration a map showing first, the various existing channels irrigation direct from the Cauvery and its tributaries in Mysore and the approximate location and area of the irrigation, second, location and the area of irrigation to be thrown out of cultivation by the construction of the large reservoir and location and area of any new irrigation or extension either above or below the new reservoir rendered feasible by the proposed large reservoir; and third, position and names of existing anikats giving supply to the above channel.

No. 101 A.—*Letter No. 4105, dated the 12th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing telegram is forwarded herewith to the Government of His Highness the Maharaja of Mysore, with the request that the map required by the Madras Government may be furnished to this office as early as possible.

No. 102.—*D. O. letter No. G. 87, dated the 27th June 1913, from the Hon'ble Lieut.-Colonel Sir Hugh Daly, K. C. I. E., C. S. I., Resident in Mysore, to the Hon'ble Sir Harold Stuart, K. C. V. O., Member of Council, Madras.*

I have had a talk with the Dewan about Clerk's official letter of the 17th June.

He considers that the figures given do not indicate that the effect of his proposed rules would be so unfavourable to Madras as the letter would seem to imply.

The data on both sides are, doubtless, uncertain; and on this ground, the Dewan's view is that we should endeavour to arrange a tentative settlement for say, six years, to be tested experimentally during that period while laying down at once the principles on which a final settlement should be framed. This has been suggested by the Mysore Government already; *vide* paragraph 9 of their letter No. 27 of the 7th July 1911, forwarded with my No. 5354 of the 1st September 1911. The eventual application of these principles would depend on the date already available and on those to be collected during the trial period. Arrangements would be made for collecting the new data according to the character of the provisional settlement.

The matters to be held in view seem to be:—

(*a*) the nature of the Madras Government's prescriptive right. This is clear.

(*b*) The amount of water required for the protection of that right. There is a provisional understanding on this point already. Only the manner in which the supply should be regulated has to be settled.

(*c*) The establishment of proper gauges along the river for determining the amount of water to be delivered at the Mysore frontier in order to give Madras the quantity to which they are entitled.

The principles to be observed seem to be clear enough and the only two of real importance seem to be:—

(i) that Madras should receive sufficient water to protect prescriptive rights; and (ii) that this should be arranged with the minimum of injury and inconvenience to Mysore.

If such a tentative arrangement could be made, the Durbar would bind themselves fully, in the matter of meeting their obligations at the end of the experimental period, if it then appeared that the arrangement needed revision. On the other hand, the Madras Government would doubtless agree that, if they at any time constructed a new reservoir affecting the supply at the Upper Anikat, the whole position should be reconsidered. For such a reservoir might interrupt and materially reduce the supply that would otherwise find its way to the Cauvery Anikat, except in cases contemplated by the Dewan's Rule VI.

Under the Dewan's proposed Rule I, there is to be no impounding on any day at Kannambadi until the supply at Sivasamudram exceeds 12,000 cusecs. This proposal involves a material sacrifice on the part of Mysore, for, on all occasions on which the net yield from the tributaries below Sivasamudram exceeds 14,600 cusecs, the excess would necessarily run to waste at the Cauvery Anikat to the detriment of Mysore. The Dewan urges that, subject to seasonal vicissitudes which are beyond human control, this secures Madras a minimum supply and also provides for *greater* (*not less*) regularity in the supply.

With reference to Clerk's remark as to a possible loss of 5,000 or 6,000 million cubic feet which will only occur in a very bad year, please note that this quantity does not apparently exceed from 2 to 4 per cent of the annual amount *actually used* by Madras for irrigation *in the very worst years*. The average amount so used appears to be about 200,000 million cubic feet, a similar quantity running to waste. If this is correct, the risk of a loss of from 2 to 4 per cent hardly seems important enough to vitiate the scheme, and some of this loss might, by arrangement, be prevented. Even this loss occurs only in the worst years; at other times it is inappreciable. Moreover, Mysore would usually fill their reservoir in July and the first half of August.

The Durbar are quite prepared to regulate their cultivation with reference to actual storage, and the Dewan is in no way perturbed by Clerk's calculation that the Mysore Reservoir would have run dry in May 1906. Great efforts are being made to complete promptly the information which you require and I hope to let you have the last of it by the end of this month.

The Durbar note with pleasure that you are also expediting the information for which they have asked; but the Dewan has observed that you have not so far replied officially to his letter No. 838, dated the 31st March 1913. I am writing officially about the telegram to me from the Foreign Department as to the reference to the Arbitrators, if recourse is had to arbitration. The Dewan thinks, and I agree with him, that the suggested reference does not cover what is really at issue. We stand on the Agreement of 1892. There is no question of division of surplus water, and the points for decision seem to me to be really:—

I sent you a copy of this demi-officially on the 2nd April and you replied demi-officially on the 4th that Clerk and Ellis found in it nothing to modify their objections to the Mysore project. The same letter went to you officially with my C. No. 27 of the 1st May 1913.

(i) What is the quantity of water required by and due to Madras under the 1892 Agreement?

(ii) How should the flow be measured and regulated in order to secure the Durbar's observance of their obligations?

(iii) In what manner can the protection of the prescriptive rights of Madras be safeguarded with the minimum loss to Mysore?

To sum up, may I draw your special attention to two suggestions:—

(i) Would you not be amply protected from any real risk by the provision that there is to be no storage at Kannambadi until the daily supply at Sivasamudram has exceeded 12,000 cusecs which is the maximum average discharge actually drawn off for use in any irrigation month at the Upper Anikat?

(ii) Does not Clerk's official letter of the 17th June indicate that there is no really vital objection to the Dewan's proposed rules?

The Dewan is ready and anxious to answer any questions. He seems disposed to think that there might be advantage in a further verbal exchange of views with you and your officers. He is ready to run up to Ooty, if desired, for this purpose and I should be glad to accompany him.

Generally, the Durbar's view is that we are within reach of a settlement without arbitration, which they would much prefer. Having said so much, they are content to leave it to you to decide whether there shall be arbitration or not.

No. 102 A.—*Telegram, demi-official, dated the 1st July 1913, from Madras Irrigation, to the Hon'ble the Resident in Mysore.*

Demi-official. Your demi-official letter dated 27th June No. C. 87 Cauvery Reservoir. We cannot accept Dewan's proposed scheme because, rough tables prepared by us on data available show conclusively that supply would give us less than our requirements to serious detriment to our existing irrigation. Our objection to Mysore reservoir must therefore be maintained, further personal conference unlikely to be fruitful and we should prefer to proceed to arbitration without delay; if Mysore wishes to make further proposals it will probably secure a more speedy settlement if these are laid before the Arbitrator. Griffin can commence proceedings on sixteenth July and we suggest that he should sit at Ooty. We have not yet received from India terms of reference to which you allude, we shall be glad to receive immediately further statistics promised by end of June and we will send you shortly details, reply to Dewan's letter No. 838, dated 31st March.

No. 102 B.—*Telegram, demi-official, dated the 2nd July 1913, from the Resident in Mysore, to Madras Irrigation.*

Subject to agreement as to main terms of reference Durbar will be prepared on 16th July for arbitration on lines of Dewan's letter 609 of 22nd January last, and my C. 26 of 1st May, as stated in Foreign telegram 1301-I. B., June 3rd (stop) Durbar suggest that Griffin, while commencing proceedings at Ooty, should come to Bangalore after about ten days, returning to Ooty, if necessary, and that he and Nethersole might, if necessary, frame subordinate issues as enquiry proceeds (stop) I await your reply to my official letter C. 88, June 27th, about terms of reference. Addressed to Madras Irrigation, Ooty, repeated Foreign Simla.

No. 102 C.—*Letter No. 4127, dated the 13th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Dewan of Mysore.*

A copy of the foregoing correspondence is forwarded herewith to the Dewan of Mysore for information.

This correspondence is to be treated as official at the request of the Government of Madras.

No. 103.—*Letter No. 867—5763, dated the 16th July 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

I am directed to acknowledge the receipt of your Endorsement No. 4196, dated the 16th instant, forwarding copy of a telegram from the Government of Madras

and to state that the Chief Engineer, Mysore, will represent the Mysore Durbar at the proceedings of the Committee of Arbitration in connection with the storage of the Cauvery waters. He is expected to arrive at Ootacamund on the 19th instant.

2. Up to 7 P.M. to-day, the Dewan has not received a copy of the message as stated in the Madras Government telegram.

No. 104.—*Telegram No. 26-0, dated the 16th July 1913, from the Government of Madras, Public Works Department, Irrigation Branch, to the Resident in Mysore.*

Sir Henry Griffin commenced proceedings arbitration to-day and adjourned until tomorrow as no representative of Mysore Durbar present (stop). Please request Durbar to depute representative to avoid further adjournments (stop). Repeated to Dewan, Mysore.

No. 104 A.—*Letter No. 4196, dated the 16th July 1913, from the First Assistant to the Hon'ble the Resident in Mysore, to the Government of Mysore.*

A copy of the foregoing telegram is forwarded herewith to the Government of His Highness the Maharaja of Mysore for favour of necessary action, with the request that the action taken may be intimated to this office at a very early date

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No. 105.—*Letter No. 866—5762, dated the 16th July 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

I am directed to enclose for your information copy of a telegram sent this day by the Dewan to Sir Harry Griffin at Ootacamund intimating that the Officiating Chief Engineer, Mysore Government, will represent the Mysore Durbar at the Proceedings of the Arbitration Committee in connection with the storage of the Cauvery waters.

No. 105 A.—*Telegram, dated the 16th July 1913, from the Dewan of Mysore, Bangalore, to Sir Harry Griffin, Ootacamund Club, Ootacamund.*

"Officiating Chief Engineer, Mysore Government, will represent Mysore Durbar (stop). Arrive Ooty on nineteenth afternoon (stop)."

No. 106.—*Letter No. 874—5796, dated the 17th July 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

I am directed to reply to your letter C. No. 52, dated the 12th June 1913, enclosing copy of letter R. O. C. No. 106-0—13-1, dated the 11th June 1913, from the Government of Madras (Irrigation Department), to the Government of India (Public Works Department).

2. The latest demands put forward by the Madras Government for the protection of the existing Cauvery Irrigation according to this letter are:—

(1) A discharge equivalent to the normal discharge due to a depth of 7 feet on the Cauvery Dam gauge at the Upper Anikat.

(2) This discharge to be measured on the Cauvery and its tributaries immediately above the water-spread of the Kannambadi Reservoir and at a station on the Kabbani river about forty miles above its junction with the Cauvery.

(3) A right to call for an additional quantity of water for thirty days in any year. (This claim is said to have been based on existing practice in past years since the Upper Anikat has been re-modelled).

(4) The quantity of water actually required to fill Veeranam tank of the Lower Coleroon Anikat system.

(5) A percentage allowance to make up for losses by transmission on all water passed down between the reservoir at Kannambadi and the Upper Anikat.

3. In regard to the above demands, I am to reply as under:—

(1) The claim to a 7 feet discharge on the Cauvery Dam was provisionally agreed to by the Durbar. The 7 feet limit is considered too high except for two months in the year, namely, July and August 1891.

(2) The Durbar have throughout in the course of the negotiations made it plain that they are opposed to the shifting of the gauging point from the Cauvery Dam to a higher place up the river. They still maintain this position.

(3) It is not understood how this claim can arise. It is not specifically stated and it does not seem to have been based on any established rights. The Upper Anikat was re-modelled only about ten years ago, and so this demand necessitated by the remodelling cannot be based on any "prescriptive right already acquired and actually existing." It is also significant that no mention was ever made of this right in the bulky correspondence that has taken place for the last two and half years.

(4) The Veeranam tank has its own local catchment. Both Colonel Ellis and Sir John Benton have clearly stated that no regular supplies are made to the Lower Coleroon Anikat system; but that the leakage from the irrigated deltaic area is sufficient to give adequate supplies to this system, in which the tank in question is also included. This demand cannot be accepted.

(5) As regards allowances for losses by transmission, etc., it may be stated that the question will not arise at all, if the gauging point is to continue at the Cauvery Dam.

4. It has been plainly admitted by the Madras Government that they only claim for the protection of their irrigation in accordance with prescriptive rights already acquired and actually existing and to enable the Durbar to distinctly understand the situation regarding the claim to a discharge of 7 feet at the Cauvery Dam, the following additional information is necessary:—

(*a*) Detailed maps and statements showing the extent of irrigation on the Cauvery and its tributaries as it existed in 1891.

(*b*) Any new irrigation started after 1891 may be distinctly shown on the maps and in the statements.

(*c*) The daily discharge statements for the Grand Anikat showing the quantities actually passed into the Cauvery and Vennar regulators as also the quantities that surplussed into the Coleroon for the last twenty years.

(*d*) The Triennial Irrigation Revenue Reports for the years 1890 to 1905.

5. I am to add that the information under paragraph 4 is urgently required in connection with the ensuing arbitration. I am therefore to request that you will kindly move the Hon'ble the Resident to obtain the same at the earliest possible date from the Government of Madras. If there is no time to prepare the necessary copies, it is requested that arrangements may kindly be made to supply the discharge statements mentioned in clause (*c*) of the preceding paragraph in original. They will be duly returned when done with.

No. 107.—*Telegram, dated Bangalore, 17th July 1913, from the Dewan, to Madras Irrigation, Stone House, Ootacamund.*

"Received your wire sixteenth. Representative arriving nineteenth. I understood Sir Harry Griffin to say that he was not particular about having our Representative at once."

No. 108.—*Letter No. 873—5791, dated the 17th July 1913, from the Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Hon'ble the Resident in Mysore.*

In continuation of this office No. 801—5230, dated 1st July 1913, I am directed to forward the accompanying note by the Officiating Chief Engineer in which is embodied the remaining information called for by the Madras authorities in the correspondence noted below:—

(1) R. O. C. No. 58-0—13, dated 7th June 1913, received under Residency Endorsement No. 3419, dated 9th June 1913.
(2) Residency C. No. 90, dated 28th June 1913.
(3) Extract of letter No. 58-0—13-12, dated 24th June 1913, received under Residency C. No. 91, dated 28th June 1913.
(4) Letter No. 58-0—13-12-22, dated the 8th July 1913, received under Residency Endorsement No. 4071, dated the 11th July 1913.
(5) Letter No. C. 106-0—13-7, dated 2nd July 1913, received under Residency Endorsement No. 3888, dated the 5th July 1913.

2. I am to add that on account of short notice the information has been compiled in a hurry.

No. 108 A.—*Note embodying certain information called for by the Madras Government in their several letters in connection with the Cauvery Reservoir Project.*

PARA II.

(1).—STATEMENT OF DAILY DISCHARGES AT KANNAMBADI DAM SITE, ETC.

Reference to Col. Ellis' Note, dated 5th June 1913, received with the Residency Endorsement No. 3419, dated 9th June 1913.

No gauges have been maintained at the site of the dam.

To arrive at the monthly or fortnightly discharges at the Kannambadi Reservoir site, the discharges have been calculated by totalling up those at the two upper gauging stations, *viz.*, (*a*) the Chamaraja Anikat on the Cauvery and (*b*) the Sri Ramdevar on the Hemavati, and by adding to this total, the calculated flood discharges from the catchment of (*c*) the Lakshmanatirtha river and from (*d*) the remaining catchment area intercepted between the above two anikats and the Kannambadi Dam site. The division of areas is shown in the sketch map attached under para 8 below:—

These latter discharges (*c*) and (*d*), in the absence of daily gauge records, have been calculated, assuming the usual run-off factors adopted by the Mysore Engineers in similar cases.

A set of tables prepared on the above basis has already been sent with the Mysore Chief Engineer's D. O. Nos. 205, dated the 3rd June 1911, and 209, dated the 8th June 1911, to the address of Hon'ble Mr. Clerk; 2 statements marked (1) and (2) are sent now for ready reference (*vide* accompaniments P and Q).

Also, catchment areas of the several streams mentioned in the statements together with the rainfall have been shown in Appendix C sent with this office No. 747—4929, dated 18th June 1913.

PARA IV.

(2).—KABBANI DISCHARGE.

A.—There is only one anikat across the Kabbani at Hulhalli and there, the gauges are not maintained continuously. There are no other gauging stations above or below this anikat for the Kabbani or for its tributaries.

(3) B.—THE MYSORE RESERVOIR PROJECT.

Para iv.—The information with regard to the capacity of the reservoir and general proposals and arrangements shown in the printed Mysore Reservoir Project book, may be taken as generally correct.

PARA V. (*a*).

(4)

The existing irrigation under the channels below the reservoir site is about 40,000 acres under monsoon crops and 2,000 acres under perennial (sugar-cane, etc.,) and these will be continued to be fed direct from the river as in the past independently of the storage reservoir.

(*b*) No extensions under the channels below the reservoir are contemplated. in connection with the final stage of the reservoir scheme except what has already been proposed, *viz.*, 25,000 acres in connection with the first stage of the reservoir.

(*c*) The extensions proposed above the reservoir are in course of investigation and the exact areas and discharges are yet to be ascertained. The supplies to the existing areas below the reservoir site will not be given from the reservoir as noted above under (*a*), as it appears to have been assumed by Col. Ellis.

(*d*) The proposed new irrigation direct from the channels drawn from the reservoir final stage will be ultimately about 1,50,000 acres. This would include 25,000 acres noted under 5 (*b*), proposed for the first stage of the project.

PARA VI.

(5) THE LIMITS OF DRAW-OFF.

(*a*) For existing channels below the reservoir, there will be no excess over the existing draw-off, as no extension is at present contemplated except what is mentioned under para V (*b*) above.

(*b*) The average draw-off from the reservoir final stage as at present contemplated will be about 1,800 cusecs.

(*c*) *Vide* reply to V (*c*) noted above.

(6) Note under para VI. The limit of draw-off referred to, *viz.*, 2,332 m.c.ft. per fortnight corresponding to 1,800 cusecs will not be exceeded on the average except on some occasions during the heavy floods.

The quantity drawn-off the reservoir can be easily measured at the sluice gates.

It may here be stated that it is not intended to restrict the area of cultivation to the exact limit mentioned in the project, as this must necessarily depend upon the balance of water after the more or less uncertain power demands are met and upon the economical use of water in which future improvements may be secured.

Reference to D. O., dated 24th June 1913.

(7) The gauge readings and discharges for the Sivasamudram, the Alalkatte and the Sri Ramdevar Anikats for the years 1910, 1911 and 1912 have now been asked for by Col. Ellis. But the discharges have not been computed and it is not practicable to get all this done within the short time fixed for the arbitration. The gauge reading books will be forwarded, if so desired by the Madras authorities.

Reference to C. No. 90, dated 28th June 1913.

(8) A tracing showing the rain gauge stations and anikats where discharges are measured is herewith sent (*vide* accompaniment S).

Reference to C. No. 91, dated 28th June 1913.

(9) A short memo showing how heads of discharges have been calculated at the two branches of the Sivasamudram Anikat is also forwarded, with 1 tracing and 1 table (*vide* accompaniment R).

Reference to Residency Endorsement No. 4071, dated the 11th July 1913.

(10) The difference in the readings of 1901 noticed at Sivasamudram is due to the incomplete state of the gauging weirs as the operations were started from that year only.

Other differences noticed in the gauges have already been explained in this office C. No. 34-60, dated 16th June 1913.

Reference to Residency Endorsement No. 3888, dated 5th July 1913.

(11) The Chik Devarayasagar Dam below the reservoir site referred to, is quite irregular and situated below an island and so this dam is not suited for the gauging of river discharges.

(12) This completes the supply of information asked for by the Madras Government in their various communications up to date.

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